

CLAIMS

I claim:

1. A method of imaging and erasing an erasable printing form, comprising the steps of: electrically charging the printing form over its entire surface, so that liquid toner particles, which have one of individual charges opposite the charges of the printing form, and dipole and multi-pole moments directed opposite the charges of the printing form, are attracted over their entire surface by the printing form; fixing the liquid toner particles with a source of energy in accordance with a picture to be printed; one of removing and breaking down non-fixed liquid toner particles in a manner which changes ink acceptance behavior; and erasing the printing form as a whole, after an end of a printing process, by removing the fixed liquid toner particles.

2. A method according to Claim 1, including, for imaging, fixing the liquid toner particles on ~~one of~~ image locations ~~and non-image locations~~ of the printing form and, in corresponding manner, removing the liquid toner particles from ~~one of the~~ non-image locations ~~and the image locations, respectively.~~

3. A method according to Claim 1, wherein the charging step includes charging a printing form having a conductive surface.

1 4. A method according to Claim 3, wherein the charging step includes charging a
2 metal printing form.

1 5. A method according to Claim 1, wherein the charging step includes charging a
2 printing form that has a dielectric on its surface.

1 6. A method according to Claim 5, including charging the dielectric surface of the
2 printing form by corona charging.

1 7. A method according to Claim 1, wherein the fixing step includes fixing a layer
2 of the liquid toner particles applied to the surface of the printing form with a beam of
3 electromagnetic waves.

1 8. A method according to Claim 7, wherein the fixing step includes fixing the liquid
2 toner particles with a laser beam.

1 9. A method according to Claim 7, wherein the fixing step includes fixing the liquid
2 toner particles with a beam in the infrared region.

1 10. A method according to Claim 1, including providing one of the liquid toner
2 particles and the printing form with an absorber material for absorbing the energy.

1 11. A method according to Claim 10 wherein the absorber material is plastic.

1 12. A method according to Claim 1, wherein the removing step includes removing
2 the liquid toner particles which are not fixed on the surface of the printing form by one of a
3 mechanical force, a solvent which is applied under pressure, absorption, an electric field, and
4 ultrasonics.

1 13. A method according to Claim 7, and further comprising the step of additionally
2 fixing portions of the layer which have remained on the surface of the printing form by full-
3 surface treatment with ~~energy-rich~~ radiation.

1 14. A method according to Claim 13, wherein the additional fixing step includes
2 fixing the portions of the layer which have remained on the surface of the printing form with
3 heat radiation.

1 15. A method according to Claim 1, and further comprising the step of hydrophilizing
2 regions of the printing form which are not covered by the liquid toner particles for wet offset
3 printing.

1 16. A method according to Claim 1, wherein the fixing step includes fixing the liquid
2 toner particles using a focused non-coherent light source for cross-linking the liquid toner
3 particles on the surface of the printing form.

1 17. A method according to Claim 16, wherein the fixing is carried out using a
2 mercury-vapor lamp.

1 18. A method according to Claim 1, wherein the removing step includes ablating the
2 liquid toner particles from the surface of the printing form using a focused and non-coherent
3 light source.

1 19. A method according to Claim 1, wherein the erasing step includes removing a
2 remainder of the layer of fixed particles with one of a solvent, an acid, an alkaline aqueous
3 solution, a mechanical force, a high temperature, high-energy radiation, and ultrasonics.

1 20. A method according to Claim 1, wherein the erasing step includes removing the
2 remaining layer of fixed particles with an organic solvent.

1 21. A method according to Claim 19, wherein the erasing step includes removing the
2 remaining layer of fixed particles with one of an acid and an alkaline aqueous solution under
3 high pressure, so that the particles are dissolved.

1 22. A method according to Claim 19, wherein the erasing step includes removing the
2 remaining of the layer of fixed particles with one of a brush and a cleaning cloth.

1 23. An erasable printing form configured so as to be electrically chargeable on its
2 entire surface so that liquid toner particles, which have one of individual charges opposite the
3 charges of the printing form, dipole and multi-dipole moments directed opposite the charges of
4 the printing form, are attracted to the printing form, the printing form being further configured
5 so that the liquid toner particles can be fixed by a source of energy in accordance with a picture
6 to be printed, the printing form being still further configured so that non-fixed liquid toner
7 particles can be one of removed and broken down in a manner which changes ink acceptance
8 behavior, the printing form yet further being configured so that the fixed liquid toner particles
9 can be removed.

1 24. A printing form according to Claim 23, wherein the printing form is configured
2 so as to be imagable and erasable within a printing press.

1 25. A printing form according to Claim 23, wherein the printing form is configured
2 as one of a printing plate, a printing foil, and a sleeve.

1 26. An erasable printing form configured so as to be electrically chargeable on its
2 entire surface so that charged particles, which have one of individual charges opposite the

3 charges of the printing form, dipole and multi-dipole moments directed opposite the charges of
4 the printing form, are attracted to the printing form, the printing form being further configured
5 so that the charged particles can be fixed by a source of energy in accordance with a picture to
6 be printed, the printing form being still further configured so that non-fixed charged particles
7 can be one of removed and broken down in a manner which changes ink acceptance behavior,
8 the printing form yet further being configured so that the fixed charged particles can be
9 removed.

1 27. A printing press, comprising a form cylinder, and an erasable printing form
2 configured so as to be electrically chargeable on its entire surface so that liquid toner particles,
3 which have one of individual charges opposite the charges of the printing form, dipole and multi-
4 dipole moments directed opposite the charges of the printing form, are attracted to the printing
5 form, the printing form being further configured so that the liquid toner particles can be fixed
6 by a source of energy in accordance with a picture to be printed, the printing form being still
7 further configured so that non-fixed liquid toner particles can be one of removed and broken
8 down in a manner which changes ink acceptance behavior, the printing form yet further being
9 configured so that the fixed liquid toner particles can be removed.

1 28. A printing press according to Claim 27, and further comprising an imaging unit
2 arranged so as to image the printing form.

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